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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/069,088	04/29/1998	SHENG LIANG	06502.0129-0	3016

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EXAMINER

NGUYEN, VAN H

ART UNIT

PAPER NUMBER

2126

DATE MAILED: 02/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/069,088

Applicant(s)
SHENG LIANG

Examiner
VAN H. NGUYEN

Art Unit
2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Oct 31, 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-22, and 24-33 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-22, and 24-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

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DETAILED ACTION

1. This Office Action is in response to amendment C filed on October 31, 2002. Claims 1-6, 8-22, and 24-33 remain in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 8-22, and 24-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Doing et al.** (U.S. 6,018,759) in view of **Admitted Prior Art (APA)**.

As to claims 1, 9, and 17, Doing teaches (col.5, line 35-col.6, line 48) a method for time profiling (to profile) multiple threads of execution (multithreaded processing) corresponding to a program (a software program), comprising:

- determining whether register data (a state register) corresponding to a selected thread (the corresponding thread) has changed from a previous interrupt of all of the threads (col.11, lines 46-56); and

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- providing an indication (indicates) of the change (the change) for the selected thread (col.12, lines 26-53).

Doing does not explicitly teach periodically interrupting execution of all of the threads.

APA teaches periodically interrupting execution of all of the threads (periodically interrupts program execution; page 2, lines 6-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of APA with Doing because it would have provided the system of Doing with the capability of facilitating time profiling of a multithread environment.

As to claims 2, 10, and 18, Doing teaches accessing (invoking the thread switch algorithm) stored data corresponding to the selected thread and comparing (compares thread states between the threads in the processor) the stored data with register information stored following a previous interrupt (col.17, lines 31-57).

As to claims 3, 11, and 19, Doing teaches computing a value (whenever the value...is equal to the value) corresponding to the stored data and determining a relationship (the relationship) between the computed value and the previously stored register information (col.18, lines 12-40).

As to claims 4, 12, and 20, Doing teaches updating (updating) a memory segment (a memory page table) to reflect that the selected thread is running when it is determined that the computed value and the previously stored register information do not match (col.15, lines 45-65).

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As to claims 26 and 30, Doing teaches assigning a cost indicator (indicates) to an identified portion of the program that is active when it is determined that the selected thread (the thread) is running (is ready for execution; col.12, line 54-col.13, line 3).

As to claims 27 and 31, Doing teaches the cost indicator reflects a number of cycles (allocating processing cycles among the threads) the selected thread was running in the identified portion of the program (col.15, lines 45-65).

As to claims 5, 13, and 21, the rejection of claims 1, 9, and 17 above is incorporated herein in full. However, claims 5, 13, and 21 further recite:

- computing a value based on the register data; and
- comparing the computed value with register information stored following a previous suspension of the multi-threaded program.

Doing teaches (col.17, line 32-col.18, line 40):

- computing a value (the value) based on the register data (thread state register); and
- comparing (compared) the computed value with register information stored following a previous suspension of the multi-threaded program.

As to claims 6, 14, and 22, Doing teaches updating (updating) the previous register information (a memory page table) based on the computed value (col.15, lines 45-65).

As to claim 15, Doing teaches providing an indication (indicates) corresponding to a portion of the program containing the selected thread (the thread; col.12, line 54-col.13, line 3).

As to claims 28 and 32, refer to claim 27 above for rejection.

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As to claims 8, 16, and 24, Doing teaches (col.5, line 35-col.6, line 48) a method for time profiling (to profile) multiple threads of execution (multithreaded processing) corresponding to a program (a software program), comprising:

- determining whether information corresponding to processor registers (the thread state registers) for each thread indicates (indicate the state of the threads) that the thread is running by comparing (compare thread states between the threads in the processor) the information to stored information from a previous interrupt of all the thread (col.17, lines 17-57); and

- recording time-profiling information for each running thread (the thread state for all software threads dispatched to the processor is preferably maintained in the thread state registers 442 and 444; col.18, lines 42-53).

Doing does not explicitly teach periodically interrupting execution of all of the threads.

APA teaches periodically interrupting execution of all of the threads (periodically interrupts program execution; page 2, lines 6-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of APA with Doing because it would have provided the system of Doing with the capability of facilitating time profiling of a multithread environment

As to claims 29 and 33, refer to claim 27 above for rejection.

As to claim 25, refer to claim 1 above for rejection.

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Response to Arguments

3. Applicants' arguments with respect to claims 1-6, 8-22, and 24-33 have been considered but are moot in view of the new ground(s) rejection.

Applicants arguments presented issues which required the Examiner to further view the previous rejection. The Examiner conducted a further search regarding the issues mentioned in Applicant's response. Therefore, all arguments regarding the cited references of the previous rejection are moot in view of the new grounds of rejection.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAN H NGUYEN whose telephone number is (703) 306-5971. The examiner can normally be reached on Monday-Thursday from 8:30AM - 6:00PM. The examiner can also be reached on alternative Friday.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9000.

Any response to this action should be mailed to:
Commissioner of Patents and Trademark

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Washington, DC 20231

or fax to:

(703) 746-7239 (for formal communications intended for entry)

(703) 746-7238 (for After Final communications)

(703) 746-7140 (for informal or draft communications)

Van Nguyen
January 15, 2003

A handwritten signature in black ink, appearing to read 'Alvin Oberley', with a long, sweeping horizontal stroke extending to the right.

ALVIN OBERLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100